

Two new species of the genus *Margarites* (Vetigastropoda: Trochidae) from Brazil

Luiz Ricardo L. SIMONE

Museu de Zoologia da Universidade de São Paulo
Caixa Postal 42494, 04299-970 São Paulo, SP, Brazil
lrsimone@usp.br

Adolpho BIRMAN

Rua Gabriel dos Santos, 168-51, 01231-010 São Paulo, SP, Brazil
egbirman@usp.br

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ABSTRACT. Two new species of Trochidae are described from the Brazilian coast, *Margarites mirabilis* from off Cassino, Rio Grande do Sul, and *M. imperialis* from off Itapemirim, Espírito Santo. Both are compared with two other species from the same area. The species possess dotted sub-sutural threads, but differ in the morphology of the spiral cords, of the other features and of the umbilicus.

INTRODUCTION

The genus *Margarites* Gray, 1847 is represented worldwide, being mainly characterized by a turbiniform, flat shell with conspicuous nacre, convex whorls (Moore, 1960) and thin outer shell layers, sustaining a shell with an external iridescent shining. An evaluation of the number of species belonging to this genus is difficult because some authors include them in the genus *Calliostoma* Swainson, 1840 (e.g., Quinn, 1992). However, two species are reported from the Brazilian region: *M. dnopherus* Watson, 1879, from off Pernambuco, Brazil and *M. atlantoides* (Quinn, 1992), from Lesser Antilles (Rios, 1994; Rosenberg, 2004).

A review of the genus *Margarites* from the Brazilian coast has been performed. Evidences of new species and a deeper comprehension of the known ones resulted from this review. The present paper is part of that study, focusing on the formal description of two species found in dredges of the Instituto Oceanográfico da Universidade de São Paulo (IOUSP).

The data on *M. dnopherus* are based on the review by Quinn (1992: 99-100, figs 67-69) and on photos of the lectotype sent by The Natural History Museum, London. This species is the comparative basis for the present descriptions.

As abbreviations of the institutions are used: ANSP, Academy of Natural Sciences of Philadelphia; BMNH, The National History Museum, London; MZSP, Museu de Zoologia da Universidade de São Paulo

SYSTEMATICS

Family **TROCHIDAE** Rafinesque, 1815

Subfamily **MARGARITINAE** Stoliczka, 1868

Genus *Margarites* Gray, 1780

Type species *Trochus helicinus* Fabricius, 1780, OD, Recent, North Atlantic.

Margarites mirabilis n. sp.

Figs 1-5, 11

Margarites dnopherus: Rios, 1994: 30 (part) (non Watson, 1879).

Type material. Holotype: Museu de Zoologia da Universidade de São Paulo MZSP 46025.

Paratypes: Brazil; Rio Grande do Sul; off Cassino, 33°31'S 51°41'W, 85 m depth, MZSP 46026, 12 shells, ANSP 412951, 1 shell; BMNH 20050261, 1 shell; Rio Grande do Sul; off Porto Alegre, 30°43'S 44°05'W, MZSP 40193, about 90m depth, 3 shells (1978, Colella leg.).

Type locality. Brazil; Rio Grande do Sul; off Cassino, 33°31'S 51°41'W, 85 m depth (sta. IOUSP E321; 09/ii/1969).

Diagnosis. Shell sculptured by spiral, somewhat uniform, well spaced cords, becoming gradually taller and more spaced from umbilicus to superior suture; two subsutural cords uniformly interrupted, with elongated nodes. Umbilicus narrow, covered by a thin, smooth callus.

Description. Shell of medium size (diameter up to 15 mm), turbiniform, rather depressed, up to 5 convex whorls. Color brownish, iridescent purple; spiral cords whitish. Spire bluntly pointed, with approximately same height as body whorl; body whorl wide. Protoconch (Fig. 4) consisting of one, relatively small,

smooth, convex whorl, border with teleoconch unclear. Remaining spiral whorls convex; sculptured by relatively tall uniform spiral cords (Figs 1, 3), with space between successive cords equivalent to their width.

First teleoconch whorl with two spiral cords, these cords gradually increasing in size and number up to last spire whorl, with about six cords. One or two subsutural spiral cords gradually becoming uniformly granular on second teleoconch whorl, forming successive elongated nodes with height and width equivalent to those of remaining cords, lying up to outer lip.

Body whorl with about 15 or 16 spiral cords, those of inferior surface (about 10 in number) slightly low, with interspaces equivalent to half of cords width. In transition to superior surface, cords gradually becoming taller and more spaced, with characters similar to those of last whorl.

Aperture (Figs 3, 5) rounded, slightly prosocline. Outer lip simple, bearing small outer projections relative to each spiral sculpture. Inner lip smooth, with narrow projection covering umbilicus, and thin, transparent callus extending beyond covering inferior surface of beginning of body whorl. Umbilicus (Figs 2, 5) opened, narrow, deep; surrounded by thick, whitish wall sculptured by transversal undulations. Transition between umbilical area and sculptured region of body whorl marked by broad, smooth fold.

Head-foot (based on dry specimens) (Fig. 11). Head wide, tentacles long, narrow. Ommatophore in posterior side of tentacles base. Eye relatively large. Snout about 1/3 of total head-foot length; anterior surface flat, with several short papillae in edge. Very thick foot occupying about half of head-foot volume and about 1/3 of shell body whorl. Epipodium covering about 1/3 of dorsal foot surface; edges with series of broad papillae, irregularly sized, from opercular pad to snout base. Columellar muscle of about 1/3 whorl, very thick, more than half of head-foot thickness.

Operculum. Circular, horny, semi-transparent, very flexible, multispiral, with central nucleus, occupying entire shell aperture (Fig. 3). Inner surface glossy smooth; scar elliptical, restrict to inner half.

Measurements (larger diameter and height). Holotype: 12.3 x 10.0 mm; MZSP 46026 #1: 13.3 x 11.5 mm; #2: 13.2 x 11.7 mm.

Distribution. Off Rio Grande do Sul, Brazil.

Habitat. About 85 m depth.

Etymology. Latin *mirabilis*, meaning wonderful: the specific epithet refers to the beauty of the shell.

Margarites imperialis n. sp.

Figs 6-10

Type material. Holotype, MZSP 46027; Paratypes:

Brazil; Espírito Santo; off Itapemirim, 21° 37'S 40° 03'W, 900 m depth, MZSP 46028, 5 shells. Santa Catarina; off Paranaguá (R.V. "W. Besnard" col., 26/v/2001), 26°15.14'S 46°54.35'W, 686 m depth, MZSP 36783, 8 specimens, MZSP 36695, 2 specimens, 26°15.13'S 46°54.11'W, 640 m depth, MZSP 36787, 3 specimens.

Type locality. Brazil; Espírito Santo; off Itapemirim, 21° 37'S 40° 03'W, 900 m depth (sta. MBT 168, 7/ix/1970).

Diagnosis. Shell sculptured by spiral, somewhat uniform cords, relatively close from each other in inferior region, and three spiral cords broadly spaced located from periphery to adjacent suture; subsutural cord uniformly interrupted, with rounded nodes. Umbilicus totally covered by smooth callus.

Description. Shell of medium size (diameter up to 10 mm), turbiniform, rather depressed, up to 4 convex teleoconch whorls. Color iridescent whitish, weakly purple between cords. Spire bluntly pointed, with approximately same height as body whorl. Body whorl wide.

Protoconch (Fig. 9) consisting of one relatively large, smooth, convex whorl, border with teleoconch clear, orthocline. Remaining spiral whorls convex (Figs 6, 8, 9); sculptured by relatively tall spiral cords; space between them equivalent to 4 or 5 times their width. Subsutural spiral cord gradually becoming uniformly granular on second teleoconch whorl (Fig. 9), forming successive, weakly elongated nodes, lying up to outer lip; two other narrower spiral cords, one close to abapical suture, the other approximately at midway between **both sutures**. Body whorl with about 11 or 12 spiral cords, abapical ones (about 8) slightly low, with interspaces equivalent to half of cords width; in transition to superior surface, cords abruptly becoming taller and much more spaced, with characters similar to those of last whorl.

Aperture (Figs 7, 8) rounded, slightly prosocline. Outer lip simple, bearing small outer projections relative to each spiral cord. Inner lip smooth, with narrow projection covering umbilicus and thin, transparent callus, covering inferior surface of beginning of body whorl.

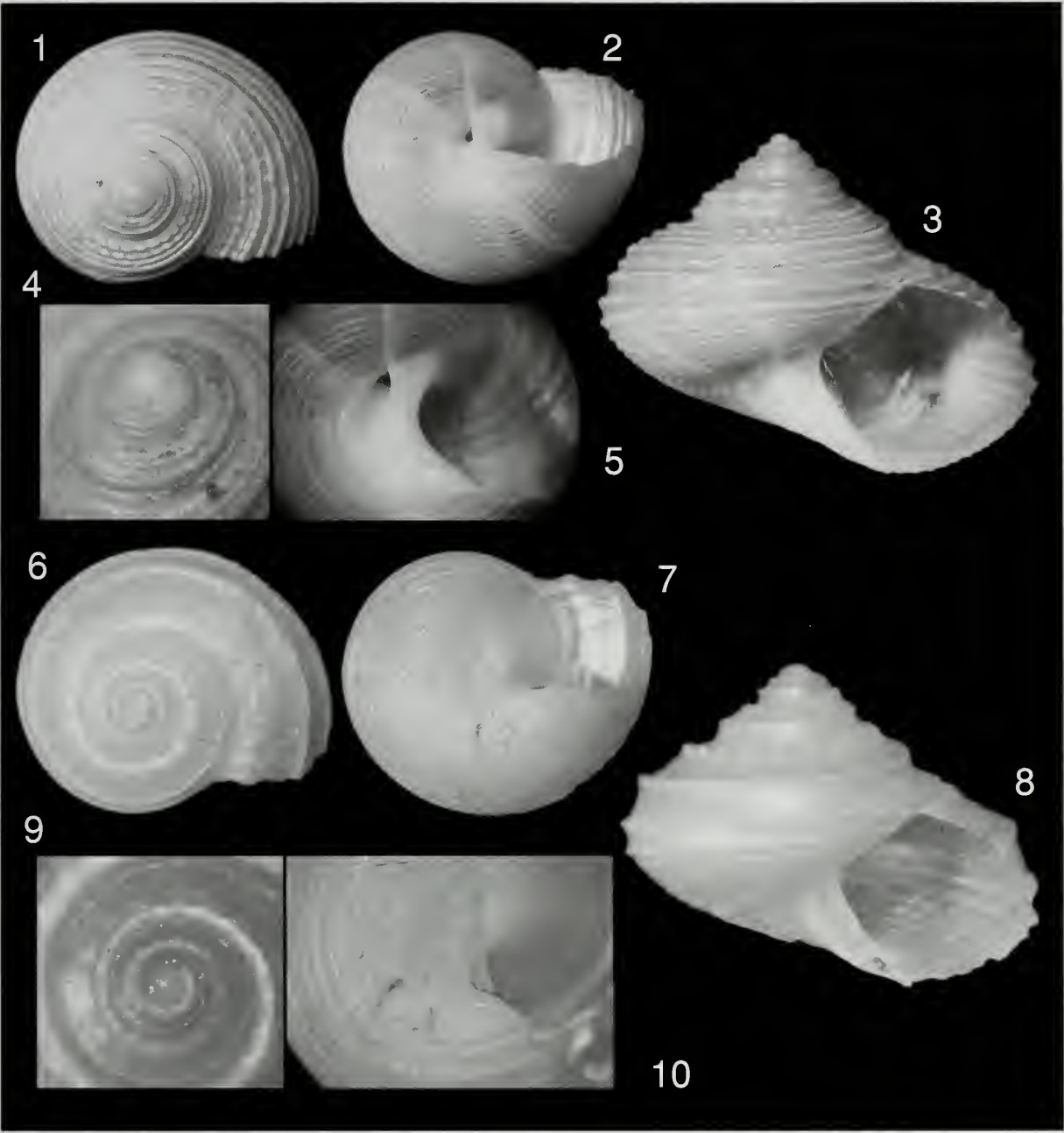
Umbilicus completely closed (Fig. 10), filled by thick, whitish wall, sculptured by transversal undulations. Transition between umbilical area and sculptured region of body whorl lacking special fold.

Measurements (larger diameter and height). Holotype: 9.6 x 7.6 mm; MZSP 46028 #1: 10.0 x 8.8 mm

Distribution. Off Espírito Santo to Santa Catarina, Brazil.

Habitat. Deepwater, from 640 to 900 m depth.

Etymology. Latin *imperatus*: the specific epithet refers to the form and attractive ornamentation of the shell, looking like an emperor crown.



Figures 1-10

1-5 *Margarites mirabilis* n. sp. Holotype MZSP 46025 (12.3 by 10.00 mm) **1**. Apical view **2**. Umbilical view **3**. Frontal view **4**. Detail of apex, apical-slightly profile view **5**. Detail of umbilicus, umbilical-slightly frontal view. Shell width = 12.3 mm.

6-10 *Margarites imperialis* n. sp. Holotype MZSP 46027 (9.6 by 7.6 mm) **6**. Apical view **7**. Umbilical view **8**. Frontal view **9**. Detail of apex, apical view **10**. Detail of umbilicus, umbilical-slightly frontal view.

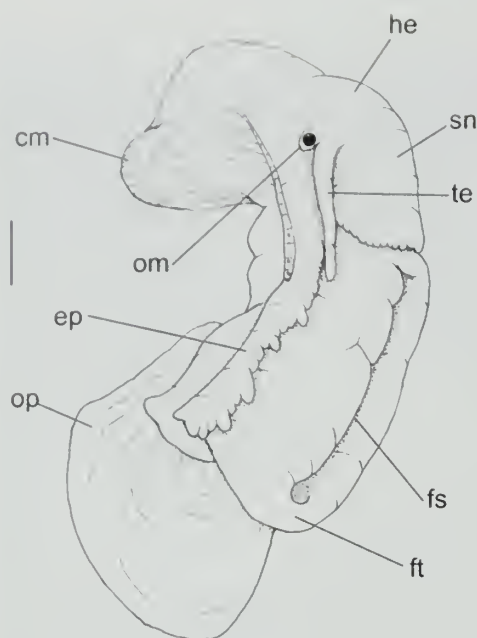


Figure 11 *Margarites mirabilis* n. sp. head-foot (dehydrated). Abbreviations: **cm**, columellar muscle; **ep**, epipodium; **fs**, foot sole; **ft**, foot (mesopodium); **he**, head; **om**, ommatophore; **op**, operculum; **sn**, snout; **te**, tentacle. Scale = 1 mm.

DISCUSSION

Both species described herein differ from most Atlantic species of *Margarites* because of their obvious sculptured shell. They can only be confused with one species from this area, *M. dnopherus* Watson, 1893, which occurs in northeastern Brazil. In a wider geographic range, both species are also similar to the Antillean *Margarites atlantoides* (Quinn, 1992), (Figs 74-75) (originally described as *Calliostoma*).

Margarites mirabilis differs from *M. dnopherus* in having a darker, purple color, a taller and more pointed spire, a sculpture with more numerous spiral threads, each thread slightly lower and closer from each other, and in having the umbilicus somewhat (but incompletely) closed by a thicker callus. *M. mirabilis* also differs from *M. atlantoides* in having a wider outline, more numerous spiral threads and a partially open umbilicus.

Margarites imperialis differs from *M. dnopherus* in being lighter colored, in having a taller and more pointed spire, spiral threads of the superior half or each whorl with taller and more separated fashion, and a totally closed umbilicus. *M. imperialis* also differs from *M. atlantoides* in having a more pointed spire, a single dotted spiral thread (instead of two), and a body whorl with a more convex abapical area.

Further comparison and additional differentiation between these species, including the radula and the inner anatomy, is being prepared in the revision of the genus from the Brazilian coast. However, as the shell brings sufficient differences and is significant for the identification, only comparison at that level is presently performed.

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